

Appl. No. 09/477,910
Amdt. dated March 12, 2004
Reply to Office Action of November 18, 2003

In the Claims

Please amend claims 1-18 and add new claims 23-26 as follows:

C1
1 1. (currently amended) An echo/near-end-crosstalk cancellation system for a bi-
2 directional data communications system comprising:
3 a first finite impulse response [[FIR]] filter;
4 a second [[FIR]] finite impulse response filter coupled to the first [[FIR]] finite impulse
5 response filter;

6 a data partitioning means for partitioning a data signal comprising echo/near-end-
7 crosstalk components such that a first portion of a partitioned data signal is processed by the first
8 [[FIR]] finite impulse response filter to provide a first filter output value, and a second portion of
9 the partitioned data signal ~~comprised of bits having a data size greater than the bit width of the~~
10 ~~first FIR filter~~ is processed by the second [[FIR]] finite impulse response filter to provide a
11 second filter output value; and

12 a combination means for subtracting the outputs of the first and second [[FIR]] finite
13 impulse response filters from the data signal to provide echo/near-end-crosstalk [[E/N]]
14 cancellation.

1 2. (currently amended) The system according to ~~Claim claim~~ claim 1, further comprising a
2 control means for adjusting the ~~plurality of first and second~~ filter output values.

1 3. (currently amended) The system according to claim 1, wherein the first
2 [[FIR]]finite impulse response filter and the second [[FIR]]finite impulse response filter are each
3 implemented as a separate integrated circuit.

1 4. (currently amended) The system according to claim 1, wherein the first
2 [[FIR]]finite impulse response filter is comprised of a plurality of filter elements.

1 5. (currently amended) The system according to claim 1, wherein the second
2 [[FIR]]finite impulse response filter is comprised of a plurality of filter elements.

1 6. (currently amended) The system according to claim 1, wherein the data
2 partitioning means comprises a plurality of conductors for conducting the first portion of the data
3 signal to the first [[FIR]]finite impulse response filter and the second portion of the data signal to
4 the second [[FIR]]finite impulse response filter.

1 7. (currently amended) The system according to claim 6, wherein the first portion of
2 the partitioned data signal is comprised of the least significant bits [[LSBs]] of the data signal
3 and the second portion is comprised of the most significant bits [[MSBs]] of the data signal.

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1 8. (currently amended) The system according to claim 6, wherein the first portion of
2 the partitioned data signal negates a first portion of an [[E/N]]echo/near-end-crosstalk signal
3 generated as a result of the transmission of the data signal.

C) 1 9. (currently amended) The system according to claim 8, wherein the second portion
2 of the partitioned data signal negates a second portion of an [[E/N]]echo/near-end-crosstalk
3 signal generated as a result of the transmission of the data signal, wherein the second portion of
4 the [[E/N]]echo/near-end-crosstalk signal is not included in the first portion.

1 10. (currently amended) The system according to claim 1, wherein the first and
2 second [[FIR]]finite impulse response filters are adaptive type filters.

1 11. (currently amended) The system according to claim 1, wherein the first and
2 second [[FIR]]finite impulse response filters are non-adaptive type filters.

1 12. (currently amended) The system according to claim 1, wherein the first and
2 second [[FIR]]finite impulse response filters are digital filters.

1 13. (currently amended) The system according to claim 1, wherein both the first and
2 second [[FIR]]finite impulse response filters are configured identically in direct form.

1 14. (currently amended) The system according to claim 1, wherein both the first and
2 second [[FIR]]finite impulse response filters are configured identically in transpose form.

1 15. (currently amended) The system according to claim 1, wherein the first and
2 second [[FIR]]finite impulse response filters are configured differently, with one being in direct
3 form and the other being in transpose form.

1 16. (currently amended) The system according to claim 2, wherein the control means
2 for adjusting the ~~plurality of~~ first and second filter output values comprises a multi-tap delay line
3 including a plurality of taps, wherein at least one programmable delay line is interposed between
4 two of the plurality of taps.

1 17. (currently amended) The system according to claim 2, wherein the control means
2 for adjusting each of the ~~plurality of~~ first and second filter output values comprises at least one
3 holding register in each [[FIR]]finite impulse response filter for implementing a unique one of a
4 plurality of adaptive delays.

1 18. (currently amended) The system according to claim 1, wherein the first and
2 second [[FIR]]finite impulse response filters filter the data signal using either fixed or floating
3 point numbers.

1 19. (original) A method for partitioning data words in an echo/near-end-crosstalk
2 cancellation circuit for a communications system, comprising the steps of:

3 determining a first bit resolution from a predetermined number of a plurality of
4 echo/near-end-crosstalk (E/N) signals having a lowest amplitude;

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5 determining a second bit resolution by subtracting the first bit resolution from a bit
6 resolution of a single signal from a plurality of E/N signals having a highest amplitude; and
7 partitioning the plurality of E/N signals such that a first portion is processed by a first FIR
8 filter having a data path identical to the first bit resolution, and a second portion comprised of
9 bits having a data size exceeding the bit width of the first FIR filter is processed by a second FIR
10 filter having a data path identical to the second bit resolution.

1 20. (original) The method according to claim 19, wherein the predetermined number
2 of signals comprises a majority of the plurality of E/N signals.

1 21. (original) The method according to claim 20, wherein the predetermined number
2 of signals comprises three quarters of the plurality of E/N signals.

1 22. (original) A method for partitioning a data signal, comprising the steps of:
2 determining from a plurality of echo/near-end-crosstalk (E/N) signals a maximum bit
3 resolution associated with a single signal having a highest amplitude;

4 selecting a first FIR filter and a second FIR filter each having a bit resolution equal to at
5 least half of the maximum bit resolution; and

6 partitioning the plurality of E/N signals such that a first portion is processed by the first
7 FIR filter, and a second portion comprised of bits having a data size greater than the bit width of
8 the first FIR filter are processed by the second FIR filter.

1 23. (new) A method for partitioning data words in an echo/near-end-crosstalk
2 cancellation circuit for a bidirectional communications system, comprising the steps of:

3 determining a first bit resolution from a predetermined number of a plurality of
4 echo/near-end-crosstalk signals, said first bit resolution comprising a majority of lowest
5 amplitude echo/near-end crosstalk signals;

6 determining a second bit resolution by subtracting the first bit resolution from a bit
7 resolution of a single signal of said plurality of echo/near-end-crosstalk signals having a highest
8 amplitude; and

9 partitioning the plurality of echo/near-end-crosstalk signals such that a first portion is
10 processed by a first finite impulse response filter having a data path identical to the first bit
11 resolution, and a second portion is processed by a second finite impulse response filter having a
12 data path identical to the second bit resolution.

1 24. (new) The method according to claim 23, wherein the predetermined number of
2 signals comprises a majority of the plurality of echo/near-end-crosstalk signals.

1 25. (new) The method according to claim 24, wherein the predetermined number of
2 signals comprises three quarters of the plurality of echo/near-end-crosstalk signals.

1 26. (new) A method for partitioning a data signal, comprising the steps of:

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- 2 determining from a plurality of echo/near-end-crosstalk signals a maximum bit resolution
 - 3 associated with a single signal having a highest amplitude;
 - 4 selecting a first finite impulse response filter and a second finite impulse response filter
 - 5 each having a bit resolution equal to at least half of the maximum bit resolution; and
 - 6 partitioning the plurality of echo/near-end-crosstalk signals such that a first portion is
 - 7 processed by the first finite impulse response filter, and a second portion is processed by the
 - 8 second finite impulse response filter.
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